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Biodiversity & threatened species

Protection of biodiversity, and threatened species conservation through habitat identification and management, are key issues for consideration in environmental impact assessment as well as during power scheme construction and management.

Issue

The loss of rare and threatened species may in cases be a significant issue arising from dam construction. This can be caused by the loss or changes to habitat during construction disturbance, or from reservoir creation, altered downstream flow patterns, or the mixing of aquatic faunas in inter-basin water transfers. Threatened species issues can relate to terrestrial and aquatic species.

Reservoir impoundment can flood extensive natural habitats, and can particularly impact on the extent of riverine forests and riparian ecosystems. Direct drowning of faunal species can occur during reservoir filling, and animal rescue programs show mixed results as species cannot necessarily assimilate into the new environments to which they are moved. Indirect impacts on species abundance and habitat quality can occur around schemes and in the catchment due to greater access, roads, human impacts, cutting of migratory corridors and habitat fragmentation.

Native aquatic species may not adapt to reservoir conditions or to the altered flow and water quality regimes in the affected river systems. More uniform flow releases out of hydro schemes, unseasonal temperature regimes, and channel sediment disturbance can favour introduced species and disadvantage native species. Benthic organisms can be most affected due to their limited mobility. Species transfers can arise with interbasin transfers of water for hydropower generation, creating genetic mixing but also shifts in ecosystem balance due to competition for food supplies and available habitat.

Conversely, in dry regions reservoirs can provide benefits for waterbirds, by providing increased habitat area and dry season refuges. This is particularly the case for reservoirs with shallow margins and limited lake level fluctuations.

Management

Hydropower developments modify existing terrestrial and aquatic habitats. Protection of biodiversity and threatened species populations need to be considered well prior to construction, at the siting and design stage, and options for mitigation identified and

assessed. Habitats of critical importance need to be identified within a wider regional context. Scheme siting and design can ensure minimization of the environmental footprint and avoidance of areas with very high biodiversity values may be able to be avoided.

At the planning stage, efforts can be put into catchment protection, creation of reserves, and habitat conservation. Targeted management plans need to be developed for species of conservation significance, as well as for managing construction related impacts. Translocations or habitat rehabilitation may be considered, along with identification of suitable habitat for 'reserve' management. Compensation measures can be undertaken which include establishing and managing protected areas of comparable area and biodiversity quality to the area inundated by reservoir creation, and/or setting up trust funds and grants for environmental purposes.

At the operational stage, management of flow releases can be utilized to preserve important aquatic ecosystem functions that will protect biodiversity. As with all management measures, monitoring and adaptive management are essential.